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February 2, 2009

TO: PARTIES INTERESTED IN EVALUATION REPORTS ON PLASTIC GLAZED SKYLIGHTS

SUBJECT: Proposed Revisions to the ICC-ES Acceptance Criteria for Plastic Glazed Skylights, Subject AC16-0209-R1 (RK)

Dear Madam or Sir:

The attached letter proposing revisions to the subject acceptance criteria, dated October 20, 2008, is being posted on the ICC-ES web site to allow for public comment. The letter requests deletion of Section A3.3, entitled "Additional Air Infiltration Tests."

The addition of Section A3.3 to the acceptance criteria, approved at the June 2007 ICC-ES Evaluation Committee hearing, was proposed by the ICC-ES staff in conjunction with other revisions that included updating the criteria to the 2006 *International Building Code* (IBC) and the 2006 *International Residential Code* (IRC).

Section A3.3 requires additional air infiltration tests of skylights, when the skylight tested under Section A3.1 does not have the greatest perimeter-to-area ratio of the skylights to be included in the evaluation report. The initial basis for the inclusion of Section A3.3 was that the amount of air leakage of a skylight is a function of the perimeter length of the skylight, not the skylight area, and because the condition of acceptance is a maximum amount of air leakage divided by the skylight area, the air leakage test results of tests of skylights under Section A3.1, without the greatest perimeter-to-area ratio, is only applicable to the skylight size tested. The test results under Section A3.1 are not representative of the actual air infiltration resistance of skylights smaller than the tested skylight.

Further review of Section N1102.4.2 of the 2006 IRC and Section 402.4.2 of the 2006 *International Energy Conservation Code* (IECC) (the IECC is referenced in Section 1301.1.1 of the 2006 IBC) indicates that both require prefabricated skylights to have an air infiltration rate not exceeding 0.3 cfm/ft², when the skylights are tested in accordance with NFRC 400-2001 or AAMA/WDMA/CSA 101/I.S.2/A440-05 (A440-05). Section 4 of NFRC 400 requires the size of the skylight tested for air infiltration to be in compliance with NFRC 100, which requires a 47-inch-by-47-inch specimen unless the skylight is a "tubular daylighting device," for which Table 4-3 of NFRC 100 requires the specimen to have a 14-inch diameter. NFRC 100 also indicates that these skylight specimen sizes are the minimum sizes to be tested. A440-05 is similar to NFRC 400 in requiring the tests to be conducted on a minimum test specimen size. However, Table 25 of A440-05 specifies

three different minimum skylight sizes (20 inches by 44 inches, 44 inches by 44 inches, and 44 inches by 95 inches) and A440-05 does not contain a specimen size for “tubular daylighting devices.” It is clear, then, that the code and code-referenced documents do not specify a consistent, specific, specimen size to be tested for air infiltration.

Since the skylight size required to be tested for air infiltration is not the same in the two documents referenced by the codes, it appears that Section A3.3 could be deleted from the criteria. However, since the condition of acceptance of the air infiltration tests is a function of the skylight area, it appears prudent that the evaluation report specify the skylight size that was subjected to the air infiltration tests of Section A3.1 of the acceptance criteria, particularly if the air infiltration rate for the actual skylight size used in each structure is needed for the heating and cooling load design calculations of the structure.

The ICC-ES staff is seeking comments from the industry and building designers on the deletion of Section A3.3 from the criteria and the revision of Section A6.2 to read as follows: **A6.2** The evaluation report shall ~~indicate~~ specify the skylight size that was tested for compliance with the air infiltration conditions of acceptance (see Section A3.1.2.2).

You are cordially invited to submit written comments, within 30 days of the date of this letter. Please use the comment form on the web site attaching any letters to the form. An explanation of the alternate criteria process can be found on our web site at http://www.icc-es.org/Criteria_Development/alternative_criteria_process.shtml.

All comments received in the 30-day comment period will be considered in preparing revisions to the criteria that may be considered at a future Evaluation Committee meeting. Comments received will be posted on the web site shortly after the close of the comment period.

Your cooperation is requested in forwarding to the Los Angeles business/regional office all material directed to the Evaluation Committee. Parties interested in the deliberations of the committee should refrain from communicating, whether in writing or verbally, with committee members. The committee reserves the right to refuse communications that do not comply with this request.

Newly approved acceptance criteria may involve test methods or test protocols that are not currently included in the scope of testing services offered by accredited testing laboratories. As noted in the ICC-ES Rules of Procedure for Evaluation Reports, the scope of the laboratory's accreditation must include the type of testing that is to be reported to ICC-ES. We encourage accredited laboratories to expand their scopes of accreditation to include testing under newly approved acceptance criteria. Please note that testing laboratories must be accredited by the International Accreditation Service (IAS) or by another accreditation body that is a signatory to the International Laboratory Accreditation Cooperation Mutual Recognition Arrangement. For further information, please contact IAS at (562) 699-0541, extension 3309, or send an e-mail to pmccullen@iasonline.org.

Please submit all comments using the form on the web site. Attach any letters to the comment form. If you have any questions (not comments), please contact the undersigned at (800) 423-6587, extension 3275. You may also reach us by e-mail at es@icc-es.org.

Yours very truly,

A handwritten signature in black ink that reads "Russ Krivchuk". The signature is written in a cursive style with a large, prominent initial "R".

Russ Krivchuk
Senior Staff Engineer

RK/cm:raf

Enclosure

cc: Evaluation Committee

To: ICC Evaluation Service, Inc.
Attn: Mr. Russ Krivchuk, P.E.
5360 Workman Mill Road
Whittier, CA 90601

October 20, 2008

From:
VELUX America Inc. ODL Tubular Skylights
P.O. Box 5001 133 Mata Way
Greenwood, SC San Marcos, CA
29648-5001 92069

Subject: AC16 and AC17 – Requested Change

Dear Mr. Krivchuk:

During a phone conversation we had a few weeks ago I expressed concern about a provision common to both of the above Acceptance Criteria, and was inquiring about the most efficient way to have the provisions revisited and perhaps changed or removed from the criteria documents. Based on your suggestion, we have decided to formally request that ICC-ES revise AC16 and AC17, as soon as reasonably practical, as indicated in this letter.

Background

On June 5, 2007 the ICC-ES Evaluation Committee approved extensive rewrites of major portions of Part A for both of these criteria. In separate staff memos for each criteria, dated May 1, 2007, rationale for those rewrites contain the following statement:

“The enclosed proposed criteria includes provisions under Section A3.3 for additional air infiltration tests when the size of the specimen tested under Section 3.1 is not the most critical skylight size, to evaluate a series of skylight sizes for air infiltration. Section A3.3 is based on an assumption that the skylights perimeter length relates to air infiltration performance.”

It is this new Section A3.3 that we are addressing in this letter.

Proposed Changes

Delete Section A3.3 in its entirety, and renumber the rest of Section A3 as needed. Applies to both AC16 and AC17.

Reasoning

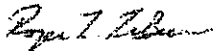
- A. In Section A1.1 of both criteria documents, several ICC code references are listed. None of the references directly refer to air infiltration performance as a “basis for recognition” for product evaluation.
- B. The referenced IBC Section **2405** and IRC Section **R308.6** both prescribe testing and labeling conforming to *AAMA/WDMA/CSA 101/I.S.2/A440* in order to determine a product’s “performance grade rating”. Air leakage performance limits in that standard/specification are an essential component of the “performance grade rating” a product will receive. For skylights, the air leakage limit specified corresponds to the IECC and the IRC Chapter 11 limits. The standard/specification also states that performance grade ratings achieved by the prescribed “gateway size” or “maximum size tested” also apply to smaller, identically constructed units.
- C. Air leakage is mainly associated with thermal performance, although it also can influence indoor air quality*. Another key measure of thermal performance for a skylight is U-Factor. Both air leakage and U-Factor are expressed in “0.XX/square foot” units. The National

Fenestration Rating Council assigns only one certified U-Factor value to cover all similarly-constructed sizes, and use of this value has been accepted as adequate by the building industry regardless of actual product size. It follows that air leakage should be similarly treated. (*In most areas, some air exchange with the exterior is beneficial and desirable.)

- D. Even though they are not part of the "basis for recognition" code sections, it is nevertheless instructive to look at the IECC and IRC Chapter 11 sections related to air leakage determination. 2006 IECC Sections 402.4.2 and 502.4.1, and 2006 IRC Section N1102.4.2, all require non-site-built fenestration to be tested for air leakage in accordance with either the above standard/specification or to NFRC 400. Testing the "gateway" size (or "maximum size tested" if a gateway size is not available) is adequate per the AAMA/... standard/specification. Testing the NFRC "standard size or larger" is called for in NFRC 400. There is explicit test size reference in both, and it is inaccurate to conclude that "the code" requires a "worst case" size be tested to be compliant.
- E. Staff's rationale statement also assumes that air leakage is mostly a function of perimeter length. While this may be true for some designs, it is definitely not true for designs that use a condensation drainage system employing weep holes that do not change with size. These holes will be the major source of air leakage in such designs. Weep holes are very common elements for skylights due to the higher likelihood of condensation in overhead fenestration.
- F. Actual air leakage through fenestration openings is driven more by variations in the quality of installation and variable ambient conditions than by product characteristics. To impose additional testing costs that yield little or no benefit when there are much larger influencers is clearly unwarranted.

We are always available to address any questions, or any clarifications you may require, related to the above. We look forward to your response.

Best regards,



Roger LeBrun
Product Certification Engineer
VELUX



David A. De Block
Director of Product Code Compliance
ODL